CLEAN AIR ACT ADVISORY COMMITTEE (CAAAC)

MARCH 28, 2001
MAYFLOWER HOTEL
WASHINGTON, D.C.

AGENDA

- Opening Remarks by Administrator Christine Todd Whitman
- Presentation and Discussion of OAR Goals and Priorities - Rob Brenner, Acting Assistant Administrator, OAR
- Subcommittee Report: Subcommittee on Linking Energy, Land Use, Transportation, and Air Quality - Bob Wyman, Co-Chair
- Subcommittee Report: Subcommittee on Economic Incentives and Regulatory Innovation - Ben Henneke, Co-Chair
- Presentation and Discussion on Linking Energy and Air Quality Policies - Paul Stolpman, Director, OAP and Jeff Keeler, Enron Corporation
- Presentation and Discussion on Technology Innovation: Towards Zero Emissions for Coal - Robert Williams, Senior Research Scientist, Center for Energy and Environmental Studies, Princeton University
- Discussion of OAR Initiatives to Foster Technology Innovation - OAR Panel
- Current Energy Demand and Supply Issues: Presentation and Discussion of Fuels and Air Quality - Paul Stolpman, Margo Oge, and Miriam Lev-On, BP/Amoco
- Current Energy Demand and Supply Issues: Presentation and Discussion of NSR and Permitting Issues - Mike Scheible, Deputy Executive Officer, California Air Resources Board and Bill Harnett, OAQPS
- Open Committee Discussion

OPENING COMMENTS AND ANNOUNCEMENTS - Rob Brenner, Acting Assistant Administrator, EPA-OAR

Rob Brenner, EPA-OAR, opened the meeting by welcoming attendees. He began with a few announcements.

Mr. Brenner stated that there have been changes in Committee membership since the last meeting. Elsie Munsell, U.S. Navy, has retired and Allison Ling will be taking her place until a new Assistant Secretary of the Navy is appointed. Charles Blackwell, Native Affairs

Development Group, has left the Committee and will be replaced shortly. Bob Ecklin, Corning Incorporated, has been replaced by Steve Scuttle, Vice President and General Manager of Corning s Environmental Technologies Division. Tim Johnson, Corning s alternate member, attended the meeting in Mr. Suttle s place. Kelly Brown, Ford Motor Company, is taking over for Helen Petrauskas. Mark Owens, Eli Lilly, has been replaced by Bill Rodecker. Barbara Bankoff attended the meeting in Bill Rodecker s place. Bruce Stram, Enron Corporation, has been replaced by Jeff Keeler. Finally, Larry Feldcamp, Baker and Batts, has retired, and Pam Giblin has taken his place on the Committee.

Mr. Brenner added that it is tradition for the Committee to invite EPA s former Assistant Administrators to become members. The former Assistant Administrator from OAR, Bob Perciasepe, IT Group, is a new member of the Committee.

Mr. Brenner announced that the next Committee meeting will be held in Washington, D.C. in either early June or late July 2001. Mr. Brenner then asked Committee members for any opening comments. No Committee members spoke at this time.

OPENING REMARKS BY ADMINISTRATOR CHRISTINE TODD WHITMAN

Administrator Whitman began by stating the importance of the Clean Air Act Advisory Committee. She acknowledged the difficulty that an entire change in administration can cause but assured the Committee that EPA s mission has not changed. Her administration s methods may differ, but their goal and mission are the same.

She stressed how enormously pleased she is with the caliber of EPA s staff. She explained what she meant by change in method. In its 30 years of service, EPA has undoubtedly improved the environment. However, some would say that the Agency has expanded beyond its intended realm. EPA has raised the public level of awareness of both the importance of the environment and the public s affect on it. The new administration now wants to move beyond a position of command-and-control to one of partnerships in which EPA and the public set shared goals. The new administration does not want to manage businesses. They want to set the standards for emissions and let the businesses find their own way to meet those goals. Air is a key focus area, whether the issue is the Kyoto treaty or the energy crisis facing the country. The country needs to start to break down the barriers between key areas and realize that a decision in any one area affects the others (e.g., decisions on water affect air).

Administrator Whitman mentioned that Vice President Cheney is chairing an energy task force for the President, of which she will be a part. She stressed that the American people need to be a part of the discussion. The public expects a certain quality of life, and while EPA respects this, a certain level of understanding must be achieved. The country wants increased energy generation and environmental protection, but the public is not leaving much room for the compromise needed for this additional electrical generation to occur. Administrator stated that no one wants to compromise human health or EPA s current standards, but the nation must make a clear decision of what it wants. The country must work to find new energy sources and enhance existing energy sources without breaking its commitment to the environment. The situation in California is just the beginning. Administrator Whitman stressed that Committee members can help EPA solve the problem and thanked them for their help.

PROGRESS, CHALLENGES, AND OPPORTUNITIES IN CLEANING OUR NATION S AIR - Rob Brenner, EPA-OAR

Mr. Brenner began his presentation by describing the country s progress towards clean air since 1970 when CAA was first implemented. Since 1970, Gross Domestic Product and VMT have more than doubled and population is up by more than a third. All of these factors would normally drive air pollution emissions higher. However, emissions are down by over 30 percent. Emissions of all main pollutants except NO_X are down. NO_X is up by 17 percent because of increased emissions from off-road vehicles and power plants.

Mr. Brenner mentioned some of the benefits of these pollution reductions. While acknowledging that these results are not without controversy, Mr. Brenner stated that most parties agree that there are significant health benefits to the 1990 CAA Amendments. The controversy is over how to value these health benefits. Mr. Brenner acknowledged Dan Greenbaum and the Health Effects Institute for their review and evaluation of studies done elsewhere. Based on the 1990 Amendments, health benefits include: 23,000 premature deaths, nearly 50,000 cases of acute bronchitis, and 4 million lost work days avoided annually. If the Tier 2 and Diesel rules are included, these numbers increase by about 50 percent.

Mr. Brenner said that the tools for success include extensive stakeholder consultation combined with national health-based air quality standards, traditional emissions limits for sources, trading and economic incentives, voluntary programs, and hybrid voluntary/enforcement programs. An example of the latter is the diesel retrofit program, which would benefit from enforceability so that those who participate can receive SIP credits.

Mr. Brenner stated that the Federal role in the air and radiation program includes setting standards for the states to implement; helping states attain standards by relying on national standards; partnering with Indian Tribes; and providing tools for states, tribes, and others to use.

Regarding air quality standards, Mr. Brenner said that EPA s progress includes lowering the number of non-attainment areas significantly since 1990. One of EPA s challenges is the implementation of the 1997 PM and ozone standards according to the Supreme Court decision. Mr. Brenner mentioned that EPA continues to be faced with the challenge of regulation reform.

In terms of vehicular pollution, Mr. Brenner stated that a great deal of progress has been made. Passenger vehicles will be 77 to 95 percent cleaner by 2004. Trucks and buses will be 90 to 95 percent cleaner by 2007. EPA is implementing the first-ever standards for off-road sources. Future challenges include the need to reduce pollution from the existing fleet, further reduce pollution from off-road sources, MTBE in drinking water, increase use of renewable fuels, and conformity (i.e., integrating air quality and transportation planning).

On the topic of the Acid Rain Program, Mr. Brenner noted that SO_2 emissions have decreased by 5 million tons a year and NO_X emissions are down 1.5 million tons a year. Progress also has been made regarding rainfall in the eastern U.S., which is up to 25 percent less acidic. However, though this represents progress, EPA has not yet reached its goal of protecting

sensitive areas from acid rain. Future challenges that EPA faces in this area include power plants, which in 2000 still emitted 11 million tons of SO_2 and five million tons of NO_x. Mr. Brenner added that EPA will need to look at legislative proposals, and EPA will be creating its own proposal to deal with these pollutants.

Mr. Brenner next highlighted EPA's progress in the area of regional NO_x emissions. The NO_x SIP Call is in place and has largely been upheld by the courts. Cars, trucks, and buses are 95 percent cleaner, and EPA has a bilateral smog agreement with Canada to reduce NO_x. Challenges in this area include coal plants, from which emissions are up by 27 percent since 1970. Mr. Brenner also stated that interstate transport remains a problem.

Regarding the area of regional haze, Mr. Brenner stated that this area, in particular, demonstrates that regional approaches really can work. State plans are due between 2003 and 2008. EPA's goal is pristine visibility conditions by 2064. EPA is working with multi-state regional organizations to determine how to best implement the program and to ensure that it is tailored to the needs of different regions of the country.

In the area of toxic air pollutants, since 1990, EPA has made great progress towards reducing emissions from stationary sources. EPA has the maximum achievable control technology standards in place for about 80 source categories, which when fully implemented in the next few years will reduce toxic emissions by 1.5 million tons per year. Emissions from vehicles will decrease by 500,000 tons a year. EPA still needs to assess how to take the appropriate steps to reduce the remaining emissions from industrial sources. It also needs to think about how to link indoor and outdoor efforts. EPA needs to better engage communities so that it thinks about risk from their perspective.

Regarding indoor air, EPA has made tremendous progress in dealing with radon, which is one of the highest risks to indoor air quality, and in developing an asthma strategy. However, EPA does not have a regulatory framework for indoor air and needs to determine whether it can continue to work effectively without a regulatory framework. EPA is working to implement cross-media approaches for reducing risk such as implementation of the radon and drinking water rules. As with toxic air pollutants, EPA needs to link its indoor work with its outdoor toxics work. Mr. Brenner mentioned that because there is no regulatory framework, EPA has learned to be creative and use innovative approaches (for example, the Ad Council campaign on asthma).

In the area of public protection from radiation, EPA has made progress in approving a WIPP site, and in preparing to propose radiation and ground water protection standards for protecting the public around the Yucca Mountain site. These standards still need to be finalized, and EPA's overall emergency response capability needs upgrading.

Regarding stratospheric ozone, Mr. Brenner stated that the program has been a success. EPA has been able to phase out and eliminate the most harmful ozone-depleting substances at far less cost than had been predicted in 1990. As a result of the phase out, EPA projects that during the 21st century, close to 3 million skin cancers will be avoided.

In terms of innovation, Mr. Brenner stated that in the energy area, EPA has been working to develop comprehensive strategies to deal with power plants and other power emitting facilities.

EPA has tried to expand its energy efficiency programs (e.g., energy star). In addition, EPA has worked to determine how best to encourage innovative technology development and use. EPA is looking for opportunities to promote Smart Growth, linking brownfields redevelopment with air quality goals, promoting smarter transit alternatives, and promoting clean urban transportation technologies (e.g., clean fleets).

In the transportation area, opportunities for innovation include the diesel retrofits program, the commuter choice program, the green vehicle guide and website, and permitting opportunities. Additional initiatives include e-government and thinking of agriculture as a sector.

In closing, Mr. Brenner reiterated OAR s vision and goals, which include achieving further improvements in air quality; managing for results; using innovative approaches; conducting sound research and using information effectively; responding to new challenges and emerging issues; and building a better partnership with state, tribal, and local governments.

Questions and Comments

Mr. Brenner stressed that Committee members comments are very important as OAR is preparing to frame its briefing for its new Assistant Administrator. Mr. Brenner asked the Committee to comment on whether EPA is targeting the right kinds of approaches and challenges.

Anthony DeLucia, American Lung Association, deferred many of his comments to the afternoon energy discussion. He stated that the American Lung Association and other groups are concerned that while things look good now, resources may not be allocated for most efficient use when one looks at where hot spot problems appear to be emerging such as coal plants. He anticipates concern over future health data for rural areas. While rural areas are eager to reap the economic benefits of these power plants, EPA needs to be mindful of the health effects, especially regarding young people. Mr. Brenner responded that the topic would be addressed later in the day.

Bill Goldsmith, Cornell University, commented on the methodology used in Mr. Brenner s last chart (on CFC consumption). Mr. Goldsmith stated that the estimate of three million fewer cases of skin cancer does not respect geopolitical boundaries. He asserted that the analysis is wrong because it does not represent global production. He suggested that Mr. Brenner correct this before briefing the new Assistant Administrator. Mr. Brenner responded that the chart is based on a success story, the Montreal Protocol, which when ratified had a structure that ensured implementation would take place. Mr. Goldsmith agreed, stating that this case then demonstrates the need for this strategy in other areas as well.

Bill Becker, STAPA/ALAPCO, stated how pleased STAPA/ALAPCO is with Administrator Whitman s decision to move forward with the truck and sulfur rule. She chose not to delay the rule. Mr. Becker stated that the passing of this rule will create huge air quality benefits. It will help states and localities attain and maintain standards. He stated STAPA/ALAPCO s hope that EPA will use the same vigor and pursue regulating non-road emissions, which exceed the emissions from off-road diesel trucks. STAPA/ALAPCO would like to join forces again to move forward on regulating these emissions.

Steve Gerritson, Pacific Rim Enterprise Center, stated that greenhouse gases were not mentioned in Mr. Brenner s presentation. Though EPA does not have regulatory authority in this area, given the widespread recognition that greenhouse gases will be either the greatest or one of the greatest problems in the coming century, there are a few initiatives that EPA should keep in mind during its planning efforts. First, there is a voluntary program already underway that should be greatly expanded. The other program involves looking for collateral mechanisms (e.g., increased fuel economy in vehicles, improved efficiency in conservation efforts and renewable energy efforts in the energy field). Mr. Gerritson also urged EPA to continue to pursue its voluntary reduction efforts. Mr. Brenner responded that EPA continues to pursue the voluntary efforts and also plans to continue attempting to address CO_2 emissions using tools developed for use in other areas. He hopes dialogue on this issue will continue in the future.

Patrick Raher, Hogan and Hartson, suggested that Mr. Brenner also brief the new Assistant Administrator on the fact that in the 1970s the ratio of benefits to costs that was 40 to 1 now is 4 to 1, showing that as reductions are achieved, attaining further reductions becomes more expensive. To make further reductions, EPA will need to identify voluntary programs and especially the incentives that will encourage people to become involved. He suggested that EPA and the Committee analyze past methods. Mr. Brenner agreed that this could be a valuable discussion for the Committee to have and an issue for EPA to address. Mr. Raher stressed that years of such discussion have been helpful, but stressed that institutional holdups exist and need to be addressed. Mr. Brenner agreed that the discussion should address disincentives as well as incentives.

Jane Delgado, National Alliance for Hispanic Health, asked what Mr. Brenner meant by the word impairment in his presentation. Mr. Brenner responded that the measures of regional haze are based on visual perception of air quality such as a person s ability to see mountains in the distance. Impairment means that visual perception is impaired. Ms. Delgado suggested that EPA use common language when briefing the new Assistant Administrator. Impairment means something different in the health field. She asserted that EPA s attempts to present information about only successes would be a disservice to the new Assistant Administrator because convoluted language is less meaningful and may deter action. She encouraged EPA to be honest about its failures as well as its accomplishments when briefing the new administration.

Ms. Delgado asked that the minutes state the importance of the crosswalk between the environment and human health. EPA has the opportunity to improve human health through improvements in air quality. She stated her hope that the briefing is not overwhelmed by the representation of industry. Mr. Brenner responded that though EPA works to present information in plain English, further work needs to be done to remove jargon from the presentation. Regarding EPA s failures, Mr. Brenner acknowledged the need to be clearer about areas that are not working. Regarding human health, Mr. Brenner stated that he made an effort to address this issue in the presentation (e.g., describing progress in terms of deaths avoided rather than dollar signs). He asked Ms. Delgado to call specific instances of this to EPA s attention.

Don Clay, Koch Industries, suggested that the briefing include EPA s relationship with the enforcement office and the need to link the two so that the rules are interpreted as intended.

Bunyan Bryant, University of Michigan, complimented Mr. Brenner on his report and Administrator Whitman on her presentation. He urged Mr. Brenner to raise the issue of environmental justice in his briefing, stressing that some portions of the population are differentially impacted by environmental hazards. He suggested that Mr. Brenner use the term environmental justice because it is generally understood by the population. He stated that when toxic reductions are spoken of in the aggregate, it does not depict accurately how individuals are affected. Mr. Brenner commented that some of the programs he described in his presentation, such as diesel retrofits, stemmed from the Committee s discussion of environmental justice. He acknowledged that EPA could do more to frame its toxics work so that it is clearer that concern over environmental justice is a driving force behind these programs.

Bob Wyman, Latham and Watkins, encouraged EPA and its new administration to place even greater emphasis on creating incentives for advanced technologies. He stated that an average ocean-going vessel at anchor burns about 3 tons of heavy marine diesel fuel a day to power its auxiliary engines. Technology exists that could replace this fuel use and not only address environmental justice in the area of the ports but also help begin a trend in new technology use. The large capital investment required to change technologies is a deterrent for many. Clear signals from EPA could remove the uncertainty that surrounds use of new technology. Mr. Wyman suggested use of emissions credits as a possible way to provide the incentive for change. In California, there is a desperate need for surplus emission reductions to offset the emission increases associated with new power generation. He urged EPA to act quickly to take advantage of this opportunity to fulfill the need for credits and encourage the development and use of new technology.

Regarding Administrator Whitman s desire for more market-based programs, Bill Rosenberg, E3 Ventures, suggested that EPA look at two possibilities: (1) elimination of disincentives such as business risks, and (2) investigation of transaction costs as a way to judge the success of market-based programs. Mr. Rosenberg urged EPA to specify what it thinks the transaction costs of regulations are and consider these costs in cost calculations.

SUBCOMMITTEE REPORT: Subcommittee on Linking Energy, Land Use, Transportation, and Air Quality - Bob Wyman, Co-Chair

Mr. Wyman stated that the Subcommittee meeting was very well attended. The Subcommittee discussed what its agenda should be for the future. Mr. Wyman briefly described results of the brainstorming that occurred at the Subcommittee s meeting. Topics of discussion included:

- Energy. Examples include how to ensure energy diversity (e.g., renewables, distributive generation) while continuing to achieve air quality goals, how to evaluate the potential impacts of changing the financial system from a regulated to unregulated system, how to encourage clean energy, and what is coal s future role?
- Transportation conformity. Has it worked well, and how can it be improved?
- Airports. Issues include inventories of emissions at airports, ground equipment, and valuable control strategies.

- Electronic commerce. Will the rise of electronic commerce change patterns of transportation and delivery of services, and would such change create air quality issues that need to be addressed?
- Trans-boundary concerns.
- Achieving a more efficient way of delivering services to create a smaller footprint for these activities.
- The need for more basic materials/analytic tools such as inventories.

Mr. Wyman stated that it is the Subcommittee's intention to fine-tune this list of objectives.

Mr. Wyman added that during the second half of the Subcommittee's meeting there were presentations regarding the relationship among Federal agencies and departments and OTAQ programs such as the National Land Use Guidance, the Clean Air Transportation Communities Program, the Commuter Choice Leadership Program.

SUBCOMMITTEE REPORT: Subcommittee on Economic Incentives and Regulatory Innovation Ben Henneke, Co-Chair

Mr. Henneke, Clean Air Action Corporation, indicated that there was a very good turnout at the Subcommittee. The group focused on what was learned from the last decade and what can be drawn from the experience with structures of economic incentive programs. They would like to get the maximum amount of return on the effort put into these programs, and that may not be occurring presently. This is an important challenge taken on by the Subcommittee.

The group reviewed the situation with RECLAIM, which frequently has been in the news recently, and compared it to the Ozone Transport Commission (OTC) NO_x budget and Title IV SO_2 programs. The comparison made it clear that technological development takes a long time to respond, longer than the time afforded by short-term signals. The group looked at design problems in RECLAIM that may have led to sub-optimal outcomes.

Then the group abstracted a level to consider design recommendations for future programs. The first idea focused on is that public health needs to drive the design of the system. The group compared outcomes to the command and control approach as a baseline. In addition, members made great points about how to make programs more holistic so that participants do not approach the issue as a transportation conformity problem but one of how to transport people without impacting air quality.

Mr. Henneke said that Commissioner Marquez, Texas Natural Resource Conservation Commission, thought that the Agency perhaps should focus on getting any program on the ground. Perhaps 80 percent of the benefit would be achieved from the first 20 percent of the work. Then they would institute the program even if incomplete, responding to other design questions and unintended consequences rather than waiting to institute a program until 100 percent of the details are completed.

The group indicated the need to make sure experimentation occurs not just on technology but also on regulatory approaches. That way, both aspects of these programs can be tested.

Mr. Henneke said that a short paper about the Subcommittee s findings will be presented to the whole Committee at a later point.

Questions and Comments

Mark Brownstein, PSEG, said he was struck by the irony that there is a new administration committed to market mechanisms but also there are questions about how market mechanisms perform under pressure. The result so far is that the air is absorbing more emissions. There is also a crisis in public confidence in the program. Those who have supported market mechanisms have to tell the public that the alternative approaches are more expensive. The challenge with RECLAIM is reassuring the public that even under pressure, market mechanisms can deliver health benefits. However, the jury remains out. Mr. Brownstein questioned whether businesses are forecasting appropriately. The tightening of the RECLAIM market was predictable. Subcommittee members all acknowledged that there is a lag between signals and response, but did the Subcommittee discuss how businesses can be more sophisticated in their forecasting?

Mr. Henneke replied that the Subcommittee did not approach this from the perspective of business forecasting. There are a couple identifiable tendencies in the three similar cap-and-allowance systems. The supply curve for allowances is vertical (i.e., fixed), so that when demand for allowances is low, the prices also are very low. When demand increases such that the fixed supply of allowances becomes a constraint on sources, demand hits at a much higher point on the supply curve. This leads to a dramatic increase in prices. Right now, only about five tons a day of extra credits are needed in the Southern California basin out of a program total of 70 tons. Yet, the price swings were wild.

Mr. Henneke stated that connected with the issue of price swings is the question of whether reductions could be delivered on schedule. The program had only a short six month banking approach, which is out of synch with the time required to build new technology. Businesses typically respond to current prices. They had not realized how different the allowance market is from a traditional market. He would be surprised if industries would be caught off-guard on the NO_X budget or the SO_2 market given what has happened in RECLAIM. The third important piece is that RECLAIM was counting on a large amount of power imported from other regions in its design. The design did not leave much room for power companies in California to create additional electricity.

Mr Brownstein suggested that the Subcommittee follow up with a plain language lessons learned document. There is a need to better design these programs and to educate the business community about them. Otherwise, it may seem logical to those on the sidelines to switch back to command and control, which would be a sad conclusion.

Mr. Henneke agreed. This was first time they designed such a program, so there is a need to learn from them and redesign and improve these programs. The redesign process is occurring, although whether the results will be improved is unknown.

Ms. Giblin stated in regards to the latter Subcommittee that in Texas, one can see two parallel approaches and can compare whether truly market-based incentives function better than command and control. They are optimistic about their cap-and-trade rule, based on facilities

abilities to price reductions on an individual basis. Texas also has a bill to implement a Carl Moyer type of program through the creation of a traditional bureaucracy that will levy fees on different business groups, some of which do not pollute. They will then administer these fees through a grant program. Regarding Mr. Wyman s Subcommittee, there is an increasing need to consider linkages to avoid the problem of unintended consequences. As an anecdote, in the Texas SIP, there is a very aggressive 90 percent reduction on point sources, which creates a large need for selective catalytic reduction retrofits. However, the fear is that facilities could create 23 tons of emissions of ammonia per 30 tons of NO_X emission reduction.

Bill Goldsmith, Cornell University, noted that it is important to remember the health, justice, and conservation aspects of emission reductions that have not been mentioned today. He also stated in reference to Mr. Brenner s presentation that a movement from a benefit to cost ratio of 40-to-1 to one of 4-to-1 remains a large difference in terms of benefits. In addition, it is misleading to state the current set of changes as a movement only from command and control to markets but also from rigidity to flexibility. There are many options within flexibility including markets, negotiation, collaboration, and providing better signals.

Mr. Brenner responded that each problem can benefit from a unique combination of these tools. Finding this combination can be a challenge for administrators.

Mr. Scheible noted that both the RECLAIM market and the deregulation of energy were flawed in design, creating a negative interaction between the two. However, RECLAIM would have had only smaller difficulties were it not for the problems that arose due to deregulation. Contingencies need to be built in when designing market mechanisms interacting in complicated markets.

Mr. Perciasepe asked whether there is an issue related to the size of the market. If there is too much supply in a small market without demand, the price will be low. The opposite also is possible. Deregulation issues could create unanticipated imbalances especially in small areas.

Mr. Henneke said that his opinion is that geographic scope does not have much to do with the problems discussed. How many sectors are involved has more to do with the problems Mr. Perciasepe mentioned rather than market geography. The Acid Rain program is national in scope but is still a narrow slice of the sectors affected if applied to NO_X. However, it is a large number of the sectors affected for SO_2. He suggests that the question of lead times for technological development across different heterogeneous source types improves market response. There is a need, however, to balance the banking period, geographic scope, how much of total inventory is involved, and other issues.

David Hawkins, Natural Resources Defense Council, endorsed Mr. Scheible s point about the interaction between two markets, RECLAIM and deregulation. Neither when adopted considered the interaction between the two. However, the criticisms of RECLAIM are independent. One criticism is that the initial allocation was large relative to demand for years. Since there was a large supply of credits in RECLAIM initially, the marginal price was far lower than the cost of controls. Businesses purchased credits without considering whether they would have to change their strategy. In contrast, for the Acid Rain market, the pool size was below the level of emissions at that time. When the market clearing price for SO_2 was first revealed, it was approximately at the level of emission control reductions. Thus, everyone paid

attention and made reductions right away rather than buying paper credits, as in the case of RECLAIM.

Mr Henneke replied that the Subcommittee discussed this problem. When they created an allocation system that is a vertical supply curve. Given that they wanted to implement it quickly, they made sure no one started in the hole and then ratcheted down the level. The initial supply was roughly 30 to 35 percent above actual emission levels. There is no question that the low price signal did not cause behavioral change to lower emissions. The Acid Rain program although it had a big step down also had some, effectively, command-and-control provisions. That plus the technological change of ash-fusion on coal meant that there was an oversupply of those allowances as well initially. One lesson learned is that you want your cap to create demand rather than be a supply limiter.

Carolyn Green, Sunoco, stated that the issue is not markets versus regulation contrary to popular belief. Markets cannot exist without a regulatory structure, so the challenge is to determine what is the appropriate regulatory structure. It should allow real competition and innovation but be flexible enough to respond to unknowns in the marketplace. Ms. Green also asked when Mr. Wyman s Subcommittee looks at E-commerce, will it look at the effects of E-commerce on energy use? As a third question, she asked whether anyone is looking at fuel use types and emissions, especially mandatory natural gas use in manufacturing.

Mr. Wyman responded that his Subcommittee is looking at the question of E-commerce and impact on energy use. In response to the second question he stated that it is the Subcommittee s intention to look at the issue of mandatory natural gas use in manufacturing.

Mr. Rosenberg stated that the success or failure of market based programs is dependent on solving the problems facing RECLAIM. Mr. Hawkins is correct, but there were two fundamental unanticipated changes -- the impact of deregulation and change of ownership of the power plants. Another problem is the decline of hydropower in the Northwest due to low rainfall. This hydropower electricity accounts for 20 percent of the power entering California. In addition, the Governor allowed plants used only for peaking purposes to run as much as possible, so there was an immediate shortage of allowances. How to resolve this shortage is one question. The other question is solving this problem for all the other sources in RECLAIM. They need adequate information in order to estimate shortages of allowances thus giving clear price signals of pollution control. One does not want to increase complexity of the program such that transaction costs are increased. Finally, Mr. Rosenberg stated that the reality is that the actual structure is a command-market versus command-and-control. There is a need to recognize that the command aspect remains critical to the market. Without a command, there is no cap to promote controls to give clear price signals.

MULTI-POLLUTANT APPROACHES FOR THE ELECTRIC POWER INDUSTRY Paul Stolpman, Director, Office of Atmospheric Programs

Mr. Stolpman began by saying that the day s session thus far should make everyone begin to realize the importance of program design, and the meeting of this Committee should further that understanding. He said that the electric power industry is a major source of three air pollutants - sulfur dioxide (SO_2), nitrogen oxides (NO_X), mercury (Hg), as well as carbon dioxide

(CO_2). Power plant emissions represent one third of NO_X emissions, a much larger proportion of SO_2 emissions (down from over 70 percent due to emission controls), a 40 percent of CO_2 emissions, and 30 to 45 percent of mercury emissions. The largest unregulated source of mercury is in this sector.

There are several concerns with these emissions. For SO_2, these include NAAQS, acidification, creation of fine particles, and regional haze problems. For NO_X, the concerns are similar but also include ozone formation and fine particles. For CO_2, the primary concern is climate change. For mercury, the concern is toxic characteristics and bioaccumulation. There were many utility emission control bills in the 106th Congress and two already of note in the 107th Congress. Those of Representative Sweeney s (HR 25) and another from Senator Jeffords. Mr. Stolpman stated that his presentation shows only a brief overview of these bills.

Regarding issues in framing a comprehensive plan, Mr. Stolpman stated that the selection of control levels for each pollutant is critical. Through the control level, one addresses the environmental side of the equation. The choice of compliance dates (i.e., lead times) for emission reductions is important. Phase in and timing of reductions, such as early reductions, are key issues. There are a number of mechanisms to achieve reductions.

In the section of his presentation entitled Selection of control levels, Mr. Stolpman compared actual 1997 baseline emissions with the levels proposed in the bills. The general characteristic for SO_2 is that the proposed reductions generally are 50 to 75 percent below those from Title IV levels or the Acid Rain bill. For NO_X, the figure is a reduction of about 60 to 70 percent from the NO_X SIP Call, applied nationally. For CO_2, some bills have no CO_2 provision and others set a goal around 1990 levels. The Sweeney and Monacan bills had no CO_2 provision. Regarding mercury, most bills call for 90 percent reductions or greater, with the exception of the Allen bill.

There is a range of compliance dates proposed in the bills proposed during the 106th and 107th Congresses. For SO_2, the compliance dates range from 2004 to 2007; for NO_X, CO_2, and Hg, most compliance dates are simultaneous for all pollutants and range from 2005 to 10 years after the enactment of the bill.

Mr. Stolpman stated that some of the bills would control mercury using source-by-source controls. Others assume that mercury can be dealt with using a cap-and-trade approach. The rationale for source-by-source controls is that the characteristics of toxicity and bioaccumulation present equity problems in local regions. In contrast, for CO_2, the location of emission is not important to the environmental issue of concern, global warming. The emission of NO_x involves more temporal and spatial concerns than for emissions of CO_2 but less than that for mercury.

The bills vary in terms of whether allowances are updated annually or whether some allowances are set aside for new sources, for encouraging efficiency, or for renewable energy sources. A key question here is whether the bills provide allowances to non-emitters that produce electricity. In terms of banking of surplus allowances, some bills have geographic trading restrictions or local control options. One big issue is whether there should be different caps for the Eastern and Western halves of the country such that the movement of allowances are restrict between zones.

Regarding the benefits of a comprehensive approach, Mr. Stolpman said that the current regulatory approaches have failed to adequately protect public health and the environment. One point forgotten in the discussion earlier is the infinite number of ways that variances are created in the command-and-control approach below the radar screen. One benefit of market mechanisms is that they make such deals more visible and public rather than hidden in a bureaucracy. Cap-and-trade approaches provide the greatest degree of certainty and flexibility for the power industry. It also should substantially reduce costs of controls to the industry. It sets uniform targets for the power sector while providing flexibility for states to address potential local impacts.

Mr. Stolpman then discussed the positions of interested parties. In terms of the states, the Northeastern states favor additional legislation, although some states have resisted the NO_X SIP Call reductions. The environmental community strongly favors reductions of all four pollutants but are resisting mercury trading. Some industry groups have expressed support provided that other regulatory requirements are streamlined. Most CEOs seem willing to engage in discussions on the subject.

LINKING ENERGY AND AIR QUALITY POLICIES: MULTI-POLLUTANT STRATEGIES FOR THE POWER GENERATION SECTOR - Jeffrey R. Keeler, Enron

Mr. Keeler said he would be talking about some of the drivers, ideas, and themes involved in the energy and environmental fields and then get into more specific approaches Enron and other companies have been exploring to see how they fit in with today's energy and environmental policy issues.

There is interest from almost all sides of the political and environmental spectrum on multiple pollutant emission controls, although for different reasons. Regulation of various pollutants or emissions under the Clean Air Act is fragmented and unpredictable. A comprehensive approach has many benefits. Industry already is in the midst of the SO_2 program and now after the NO_X litigation appears to be ending, industry is preparing for this regulation as well. Enforcement of New Source Review (NSR) also creates pressures on industry. The recent twist is whether President Bush's position on CO_2 will change the momentum and cause polarity.

Mr. Keeler then discussed common themes in multi-pollutant proposals. The concept promoted here reduces overall emissions from two to four pollutants from the power generation sector. Multi-pollutant programs promote turnover to new, cleaner, more efficient technologies. These are the environmentalist themes. Industries themes include that these proposals promote regulatory certainty and reduce regulatory overhead for all parties. Another theme or driver among many proposals is providing relief from or replacing NSR. Many proposals focus only on old, higher-polluting plants in the power generation sector. A group of companies who would like to see this broadened have formed the Clean Power Group

Mr. Keeler said that higher efficiency and low-emitting generators are key to meeting long-term emissions goals economically. An inclusive market system including all generators allows economics to drive emissions reductions, capital turnover, and infrastructure improvement. A viable approach must include support for newer, cleaner, more efficient power generation as

well as control of existing sources. One should want to remove disincentives as well as include everyone and level the playing field. The Clean Power Group involved in this project includes Enron, El Paso, Calpine, Trigen, and NiSource. Mr. Keeler stated that his presentation provided a quick overview of some of the primary ideas and the design characteristics of a good strategy.

The Clean Power Group s plan includes all generators of one megawatt or greater under a cap-and-trade program. Each pollutant is subject to a glideslope individual cap that declines continuously over time. This idea can be applied to NO_X, SO_2, Hg, and even CO_2, if desired. The Group still believes there are merits for including CO_2. Allowance trading is included for flexibility and cost reduction. It is an output-based allocation system to improve program efficiency. It includes combined heat and power, credits for energy efficiency, and renewables. An essential feature is the inclusion of economic protection, or a cost circuit breaker. It also includes NSR reform by removing BACT and LAER or major modification review. However, it retains protections such as New Source Performance Standards and local impacts review to prevent hot spots, environmental justice, and local concerns.

As an example of this concept, the Group discusses continuously declining caps rather than steps on SO_2. One can reach the same point, such as a 50 percent reduction in five years but can do so smoothly. This results in greater benefits from reductions in the early years. A declining cap puts more pressure on technology and emissions sooner than the current system and should replace the need for NSR review.

The presentation provides an example of cost circuit breaker that provides economic protection. If the average annual allowance price rises above a set amount, then the cap stops declining temporarily. When the allowance price again declines a set amount, the cap begins declining again. The devil is in the details of setting the caps and the circuit breaker. It assures companies that they can plan capital expenditures for future reductions but know that the cost will not exceed a certain amount. This provides a number of advantages.

Benefits for all stakeholders

For industry, they would not have to deal with BACT and LAER. Future regulatory requirements would be more certain. Rules would be more consistent, and costs would be spread equally among generators. Whether the caps would be divided by region or nationally would be up for debate. The environmental benefits are that reductions would be locked in immediately and the possibility of continuing emissions reductions over time. It would be technology forcing, provide economic pressure for the clean up of old plants and capital turnover as the NSR program was supposed to do, and retain control at the local level.

Addressing today s energy and environmental issues

This is relevant for California and other areas of the country potentially seeing crises. This proposal might expedite increased new generation with environmental security. It is unclear what will happen regarding emission caps on CO_2, but this idea provides options that address CO_2 without economic risk or links to Kyoto. In terms of reforming NSR, the Group believes the market functions better than enforcement actions for all interested parties. Thinking long term, one would want to design the program such that it supports new generating technologies, renewables, and conservation concerns.

There is much open for debate on this type of approach, but given the questions about how to generate more electricity and still preserve the environment, the Clean Power Group thinks this is a good market-based approach.

Mr. Brenner thanked Mr. Keeler and stated that the next presentation should challenge the Committee regarding how to think about dealing with CO_2 without harming the nation s energy supply. The next guest is a senior researcher at Center for Energy and Environmental Studies Princeton University. He has been highly regarded in the energy and environmental policy arena for taking on tough, central issues with applied scientific knowledge.

TOWARD ZERO EMISSIONS FOR COAL - Robert H. Williams, Center for Energy and Environmental Studies, Princeton University

Mr. Williams said he would be talking about energy in terms of a very long time line. New sources of energy will come about by 2020, but they will not be significant components of our energy supply until the second quarter of this century. He stated that his talk would be about climate, air quality, and energy concerns for which one needs to take a century-long perspective in order to reach society s objectives.

Outlook for coal

The conventional wisdom is that coal is the dirty fuel away from which countries evolve as they get richer. A heretical view is that coal is the basis for a low-cost approach to evolving to an energy future characterized by near-zero emissions of air pollutants and greenhouse gases. It is abundant, stable, and cheap to supply. Recoverable coal could support 600 years of current energy needs. Its supply is more stable than that of gas. The challenge is whether its dirtiness can be dealt with. The answer is yes, and it is not very difficult to reach.

The key technology is oxygen-blown gasification, which radically transforms coal energy. The present coal combustion process breaks coal down into molecules of CO_2 and water vapor. Oxygen-blown gasification uses oxygen rather than air. Instead of completely oxidizing coal, it instead partially oxidizes it. The result is production of molecules of carbon monoxide and hydrogen a combination called synthesis gas. If one considers the climate change and air quality concerns of energy, there is an opening for hydrogen as a clean energy complement to electricity. There are few other options that can achieve these goals. Coal gasification is an advanced technological opportunity for making hydrogen from coal without greenhouse gases and without having high costs for CO_2 sequestration. The price is not much different from that of using natural gas.

He stated that the presentation also discusses how sequestration costs are relatively minor and affordable without advanced technology. It looks at options for CO_2 sequestration, not deep in the ocean, but in deep geological reservoirs. It also presents a scrap-and-build Gedanken experiment for US coal plants. This is an imaginary exercise examining what technology would be chosen if one tore down all coal plants in the U.S. in 2020 and replaced them with new fuel cells to examine whether that option should be taken seriously.

Oxygen-blown gasification versus other technologies

There are four competing options for clean power generation ultra-supercritical steam generation, pressurized fluidized bed combustion, air-blown integrated gasifier/combined cycle and oxygen-blown integrated gasifier/combined cycle (IGCC). All four options possibly can convert energy at efficiencies of 40 to 45 percent given current technologies. However, not all four options are equally desirable. Speaking metaphorically, switching from the current approach to the other three is like switching from a manual to an electric typewriter. A shift to oxygen-blown IGCC generation is like shifting to laptop computers. One would not want to use IGCC only for electricity generation. It is also productive for co-generation. The two main products from this generation process ultimately will be electricity and hydrogen, but the first co-generation process likely to become population probably will be chemicals. However, that market will become saturated first. The next market to become saturated via the IGCC process is the combined heat and power market, which in a couple decades also will become saturated. The alternative fuels market would begin using this technology first, although it is not expected to become saturated.

Present technology

Currently, IGCC can convert at 44 to 46 percent efficiencies at costs that are fully competitive, although only barely so, with steam electricity plants (which are 35.5 percent efficient). Being just barely as efficient is not good enough to make businesses switch technologies. One area where IGCC really shines against steam-electricity is with co-generation where costs are dramatically lower than current technology. IGCC can achieve emissions as low as those from gas combined cycle. It provides the cheap road to deep reductions in CO_2 emissions. This happens because the process removes the CO_2 before combustion as opposed to removing it from the stack where concentrations and pressure are low. Removing CO_2 in the stack is very capital intensive. This is not true with IGCC. Moreover, efficiencies are greater than with steam-electric plants based on current technology. If society required carbon dioxide removal, the cost of electricity including carbon sequestration for coal would be equivalent to those from natural gas power plants, even at lower prices for natural gas of previous years. However, this is only possible with CO_2 sequestration, so the coal industry should be very interested in sequestration.

IGCC is growing like gangbusters in poly-generation at refineries using petroleum residuals as a feedstock, growing at a rate of 10 percent per year. This is driven by the need to upgrade the hydrogen content of heavier crudes and, more importantly, by the demand for clean fuels. The price of the technologies in the refinery applications will decrease, and this technology and price decrease will be directly transferable to coal.

Business as usual 2100

Concern about climate change demands a century-long perspective. In considering the distribution of CO_2 by activity presently, one-third comes from the power sector. By 2100 under IS-92a (the business as usual scenario of the IPCC), total tons increase from 6.2 gigatons to 20, although electricity generation will represent a lower proportion of that total. That is because fossil fuels will represent a declining amount of electricity generation in the future under IS-92a. Thus, if there were zero emissions from electricity generation, the U.S. still would have 15 gigatons of carbon emitted. Transportation and other sectors increase from 4.3 gigatons of emissions to 15. Nuclear and most renewable technologies cannot do much for the country under these scenarios. Decarbonization of fossil fuels is the only way to

achieve lower overall emissions in the future. This is possible because coal will not be used for power generation but primarily for the creation of hydrogen.

Another reason for taking this seriously comes from results from the UN s *World Energy Assessment*. Environmental damage costs from air pollutant emissions (based on actual emissions from a typical European plan) for fossil fuel power plants are expected to remain high under options such as BACT. The damage costs they list are comparable to the cost of electricity generation. The exceptions are coal IGCC and natural gas combined cycle. With IGCC, one can take a carbonaceous fuel, put it into a centralized hydrogen production plant, store the CO_2, then use the hydrogen for combined cycle to create electricity or compress it for use in buildings or vehicle fuel cells. The distribution locations can be set up near the city gates with local distribution networks in marked contrast to the current situation with natural gas.

Making hydrogen from fossil fuels

The efficiency rate in making hydrogen from natural gas today is about 80 percent. About one percent of primary energy today is committed to making hydrogen for the needs of refineries such as making ammonia. This is not futuristic technology. China makes hydrogen from coal because they do not have natural gas as an option. The efficiency for coal today is not as good but probably will be in the future. The incremental cost for this technology even today is not very high. The cost of conversion is much cheaper from natural gas with current technology than from wind even by 2030. The delivered cost of hydrogen fuel is equal to $2 per gallon gas equivalent and 10 percent higher with sequestration. Given this price and an estimated 82 miles per gallon, hydrogen fuel cells would cost 2.7 cents per mile versus four cents per mile for gasoline vehicles (at a price of $1 per gallon assuming 25 miles per gallon).

Options for CO_2 disposal

Mr. Williams stated that this part of the discussion would focus on CO_2 disposal on deep saline aquifers as the other options are of limited capacity and geographical scope. The disposal must be at a depth greater than 800 meters to remain below the critical point to store CO_2. At that depth, the water tends to be stable fossil water, not part of hydrological cycle that humans use.

Until recently, scientists thought disposal required structural traps. This limited sequestration to 50 GtC. Now, there is growing confidence in the scientific community that this is not necessary. One can use large horizontal aquifers with good imperiable top seals, injecting the CO_2 far enough from the margins of the aquifer such that only minor leaks occur. Then, countries can store an amount comparable to the total amount of carbon available in fossil fuels.

These aquifers are in deep sedimentary basins that underlie about 70 million square kilometers worldwide, two-thirds of which are on shore. They represent more than half of total land area of the continents. In the U.S., these aquifers are located in areas near coal regions. Thus, the CO_2 does not have to be transferred very far. Overseas, there are two CO_2 sequestration projects with off-shore natural gas production. One project begun in 1996 injects 1 million tons of CO_2 per year under the North Sea and another at Natuna, Indonesia that injects a large amount of CO_2 into deep aquifers. Without the carbon sequestration, the Indonesia project would represent a half a percent of total world emissions.

As an example, Erik Lindberg of Norway modeled what would happen if about six billion tons of CO_2 per year (representing a 1 GW coal plant) were injected for 25 years in an aquifer. When injected into the bottom of an aquifer, the CO_2 will rise to the top of the aquifer and spread out. The vertical and horizontal speed depends on the permiability of the aquifer. During the first 25 year period, the CO_2 advances at a rate of 16 inches per day. After the aquifer is sealed, the CO_2 advances a rate of two inches per day for 100 years, then at one inch per day for the next 100 years. The radius of the bubble expands and then contracts such that the CO_2 is completely dissolved in the aquifer after 3,500 years for an aquifer similar to the North Sea aquifer. If the aquifer has a spill point eight kilometers from the injection well, a worst case scenario is that 20 percent escapes within 4,000 years. However, scientists do not expect to have much CO_2 emissions in the future after the year 2500. Peak emissions probably will be around 2150 at 30 gigatons per year. Comparing the worst case scenario leakage in the future to emissions from the period 2000 to 2200 represents a release an order of magnitude smaller than releases in the 21st century. The problem regarding CO_2 releases from aquifers is not into the air but whether it will create carbonated water, which is an acid that can leach toxins from metals into the water.

Gedanken experiment
In this hypothetical experiment, it is assumed that in 2020, all coal power plants are replaced by hydrogen and electricity co-production plants using coal that sequester CO_2 in aquifers. It also assumes the hydrogen would be used by fuel cell vehicles. On a plant level, the hydrogen would support 155,000 fuel cell vehicles. Avoided CO_2 emissions costs would equal $47 per ton of carbon. An equivalent increase in carbon taxes or allowance prices would be equivalent to 12 cents per gallon on gasoline.

At the national level, this would result in 737 co-production plants. The power generated would replace all coal plants and 47 percent of the light duty vehicle fleet. Coal use would increase only 2 percent because of the greater generation efficiency. Oil use would decrease by 4.7 million barrels per day. CO_2 emissions would decrease from 2.04 GtC down to 1.26, just below 1990 emissions of 1.35 Gtc even after getting rid of half of the traditional vehicle fleet. This indicates the challenge facing carbon reduction policies even with no emissions from coal plants or half the light duty vehicle fleet. The CO_2 sequestration rate would be 2.2 GtC per year. This sequestration rate would be equal to 100 years of the estimated capacity in the Mt. Simon sandstone aquifer in the Midwest, one of the larger and safest aquifers.

The discussion then was opened for comments on all three presentations.

Questions and Comments

Bill Auberle, Northern Arizona University, stated that relative to a four pollutant approach a three pollutant approach does not advance regulatory certainty. Regarding Mr. Keeler s presentation, he stated that such a proposal also does not advance regulatory certainty and represents a lack of a multimedia perspective. As an example, a very large coal-fired plant in Appalachia was scrubbed for SO_2 in 1994. The opportunity cost was a significant reduction of habitat for a particular village of 250 people that decided this loss was acceptable for the greater good for the Northeast. In 2000, along came NO_X reduction requirements, and they installed SCR for NO_X reductions. The community became aware of it only when it saw new

60,000 gallon tanks under construction near the high school. When they found out the tanks were to be filled with anhydrous ammonia, the village was terrified. This is not an isolated incidence and not the first time that the greater good creates a localized danger. The country must be smarter at its national policies and expand from multi-pollutant approaches to multimedia ones to prevent unanticipated effects in other media.

Mr. Hawkins commented to Mr. Keeler that addressing anxieties about prices is a good idea. Another approach would be similar to adjustable rate mortgages to limit risk. One could explore this idea in respect to a circuit breaker approach. His question was regarding the declining cap. Would the decline stop when an average price is exceeded for the previous year? The trigger could not be the clearing price for the marginal unit exceeding the average. Mr. Keeler responded that the group has not yet gotten into the details of how the trigger would work, but that it likely would be based on the average annual price from the previous year. This would in effect be a one year lag time.

Jason Grumet, NESCAUM, thanked Mr. Williams for his presentation on the idea of clean coal. He stated that there are a couple bills in the Senate, such as those of Senator Byrd and Senator Murkowski that not only put a ten-year moratorium on some Clean Air Act programs but also has a shorter-term idea of clean coal technologies. The Northeast states are trying to find a space to be supportive of this concept of clean coal. He asked if there are going to be efforts for stand-alone clean coal bill without the attendant moratoriums on other air programs. He also asked whether there are policy opportunities for people on the Committee to support the technology Mr. Williams discussed. He asked whether Mr. Williams is involved in such discussions.

Mr. Williams replied that he has not been involved in such discussions and asked for advice from the Committee on how to become involved. The key point is that once society decides it wants a long term goal of near zero emissions from coal, at that point, it tells one what needs to be done to get there. The country must give high priority to oxygen blown gasification because there is no other option to reach this goal. Essentially, the demonstration projects for this technology are already completed. Between 1984 and 1989 the Coldwater Demonstration Plant showed this technology to be a tremendous success. However, the technology did not catch on because it coincided with the time when natural gas combined cycle already was taking over the market. Polygeneration will put the country onto the path to IGCC success and zero emissions.

Dan Greenbaum, Health Effects Institute, asked roughly what percentage of the utility industry in the U.S. supports a multi-pollutant approach. His second question was in absence of new legislation, to what extent does the Agency have the authority to do some part of these things? What is the net added value of this approach?

Mr. Keeler responded that the support for this approach depends on the exact proposals, which is why there are so many proposals. He would guess that a large fraction supports it.

Mr. Stolpman added that it is anybody s guess as to whether the levels proposed in the bills could be met under existing authority. They probably need to address getting more SO_2 out of the system; the main pressure probably would be the fine particle standard. Regarding additional NO_X, would they go national and annual? Maybe under the new eight-hour standard

for ozone, the NO_x budget approach for NO_x SIP Call could be geographically expanded. Mercury is relatively easy to see how to get that done under a MACT approach, under section 112. He thinks the real issue is can one cobble together an approach efficiently? They cannot they be pulled together under the Clean Air Act efficiently.

Mr. Becker stated that most, if not all, of the states seem to like BACT and LAER. They believe these technologies are more efficient to put this on when sources are new than to retrofit. Given the suggestions for reforms to the New Source Review program, why would the Clean Power Group not include a robust BACT/LAER in its proposal as a good insurance policy?

Mr. Keeler responded that they need to look at this issue more closely. They were focused more on major modification enforcement efforts. In terms of state and local, they have considered retaining NSPS and local impact review. Some people did mention retaining some BACT or LAER. This needs to be explored and needs to evolve more. If the concern is to force BACT or LAER to happen through technology, his response would be that in theory, technology forcing should happen anyway due to declining caps that ratchet down each year.

Mr. Gerritson asked Mr. Williams if the goal is to produce clean energy from coal, could he compare doing so from coal versus other sources, such as sea water? What happens to the other impurities in coal? Mr. Williams responded that his graphs show that it is cheaper to make energy from coal than from gas or other feedstocks. These technologies reduce the capital cost and, thus, highlight the cost of the feedstock. The break-even price of generating electricity from hydrogen made via any electrolytic process besides natural gas or coal would have to be below $0.01 per kwh. This level has not and will not be seen during this century. Regarding Mr. Gerritson s second question, after gasifying coal, the synthesis gas is cooled. Then the remaining impurities can be removed using current technologies. On another note, he stated that this group appears mainly to be concerned with incentives. It is not apparent that this technology fits comfortably in either the electric power or coal industry. Its natural home is in the chemical and petroleum refinery industries. Power generation could shift to the chemical process and petroleum refining industries and away from the power industry. They are the only ones who understand this technology inside an out. Unfortunately, the chemical and petroleum industry all divested themselves of coal use a decade ago.

Mr. Brenner noted that this was food for thought.

Mr. Johnson said that he was not satisfied that existing control technology can take care of mercury and other impurities in coal. What happens to that stream of impurities? In terms of incentives, the key variable is the time it takes to make investments to get the desired outcomes. Industry says that if they are given more time to adjust to new technology up front, they can reach a better outcome. If this is such a panacea, what can be done in terms of incentives to get this technology adopted more quickly? Is it politically feasible?

Mr. Williams responded that one has to pay attention to non-criteria pollutants. However, with IGCC, one does not need to use hot gas technology. They can instead use cool gas technology at ambient temperature, when the pollutants are not as mixed with nitrogen. This impurity removal process is more daunting for the alternative technologies. The more general issue is that one has to pay attention to the details of clean coal technology. Most other

approaches are not going to get you close to near zero emissions. However, this is all premised on having a zero emissions policy set by the policy community that provides incentives to the people involved in technology.

Mr. Johnson indicated that he remained uncertain about emissions even though they would be using cool gas technology. The concern with this technology even now when removed is what happens to the mercury.

John Paul, RAPCA, asked a follow up question regarding BACT/LAER. He always found agreement on application of BACT or LAER on new units. With a four-pollutant strategy, they saw it as a way to resolve issues around modification. A four-pollutant strategy bill will regulate on two levels with at least BACT to provide certainty about those units and future modifications. States and locals will want to see BACT/LAER decided on a case-by-case basis.

Mr. Keeler responded that sometimes if the technology used is close to BACT relative to existing units but not quite BACT, this may provide a large economic benefit but not a big environmental effect.

Mr. Paul responded that Mr. Keeler is comparing from a poor base. Once control technologies are put on existing units, the increment Mr. Keeler is discussing does not seem so large. With utilities, one is talking about 45 to 65 years of operations. Although their emission levels are better than what is existing, this is not an appropriate base for measurement.

Mr. Hawkins stated that there is a problem with relying on declining caps as a tool to achieve results similar to those delivered by BACT or LAER requirements. The real world test of whether these levels can be met with only caps is RECLAIM. Experience shows the brittleness of relying on only one tool. If generators in the South Coast basin had been equipped with anything close to BACT, they would not have had the current price spikes in allowances or the conflict between running the generators and staying within the air quality objectives of the system. Now, they have generators saying publicly that they want to blow out the caps to prevent blackouts. To design a system that says the market will force units to conform or else the units will stop running seems particularly unlikely in the electric generating sector. A more robust system that is responsive to the real world would have backstops such as BACT.

Mr. Johnson said that step changes in emission regulation have worked successfully in the past to stimulate technological development. They have had step changes in technological development that can be explored and predicted with certainty. How would the circuit-breaker scenario affect technology development?

Mr. Keeler said that they had not been thinking of this issue as would a control technology manufacturer. The concern with a step system is that it creates a backlog in technology needs. Generators tend to wait to the last minute to make capital investment decisions, as has been found during the NO_x SIP Call and NAAQS litigations. They wait until one to two years from implementation to make capital investments. This can cause problems with availability of technology and labor shortages. Even when the cap stops declining due to a cost trigger, the way to bring down the price of allowances is through new technology. He stated that he is open to other perspectives and input. However, he does not like steps; they

lead to tremendous cost increases.

DISCUSSION OF OAR INITIATIVES TO FOSTER TECHNOLOGY INNOVATION

The discussion of OAR Initiatives to foster technology innovation was postponed until the summer meeting so that enough time could be set aside for a full discussion. Mr. Brenner asked Committee members to inform him of any suggestions regarding specific discussion topics.

CURRENT ENERGY DEMAND AND SUPPLY ISSUES: BP s Perspective on Fuels and Air Quality Issues - Miriam Lev-On, BP/Amoco

Ms. Lev-On began by informing the Committee that the new BP consists of the old BP, Amoco, ARCO, and Castrol. Ms. Lev-On next commented on the challenge that the U.S. is currently facing. Energy and the environment are inextricably linked. Hydrocarbons, particularly oil and gas, will be the primary source of energy growth for at least the next 50 years. She stated that vehicles and fuels are part of an integrated system that must be optimized to minimize emissions. In the last decade, there has been an increasing shift in energy use towards lower carbon intensity fuels.

Ms. Lev-On mentioned that the new, integrated BP company has 45 percent of its assets and manpower in the U.S., and it is the second largest manufacturer of petroleum products in the U.S.

On the subject of U.S. gasoline supply and demand, Ms. Lev-On commented on both refining and distribution and projected demand. Regarding refining and distribution, she stated that the trend is to regionalize markets. Areas such as Europe, South America, and Sub-Saharan Africa all are working to maximize regional flexibility by pulling together larger markets to gain from the economic momentum of these markets. In the U.S., there has been a Balkanization of the gasoline market. Forty-nine states use multiple types of boutique gasolines, which results in lower distribution flexibility. Further, refineries are operating at a peak utilization rate of above 95 percent of today s capacity, which does not leave much room for maneuvering.

On the demand side, the EIA forecasts that U.S. petroleum product demand will increase from 20 million to 25 million barrels (Bbls) a day by 2020. This implies that the U.S. will need to increase incremental refining capacity to meet this projected demand, import finished petroleum products, or work to conserve.

Regarding the reformulated gasoline (RFG)-oxygenates issue, Ms. Lev-On stated that BP supports EPA s RFG program. However, BP has some issues with the current program. She stated that with new vehicle technology, oxygenates are not needed for cleaner air. For example, when ARCO first introduced emission control gasoline in 1989, it had oxygenate/MTBE in it and was aimed at the older vehicle fleet (primarily the non-catalyst vehicle fleet) that existed in California at that time. With the new vehicle technology (e.g., oxygen sensors), oxygen is not needed in the fuel to optimize emission reduction. BP has come to the conclusion that MTBE should be phased out in an orderly transition and Clean Air Act requirements should be changed accordingly.

Ms. Lev-On informed the Committee that during the BP merger discussions, BP committed to the Governor of California to remove MTBE from its fuels prior to the mandatory ban at the end of 2003. Since the merger, BP has been working on a study of the technical feasibility and supply issues in California. BP has concluded that it will be extremely difficult to maintain the volume supply in California if BP removes MTBE but does not receive a waiver. Ms. Lev-On stated that the U.S. needs a federal signal on how to affect this transition (i.e., how to prevent supply volatility while maintaining air quality goals).

On the subject of BP's view of EPA's final diesel rule, Ms. Lev-On stated that BP supports the final diesel rule. BP feels that it provides the needed emissions reductions, reduces the need for states to pursue more stringent diesel fuel regulations, and provides clean diesel for the introduction of diesel cars and SUVs. She commented that the final rule decreases the potential for supply shortages because of flexibilities built into the final rule and allows clean diesel to compete with alternative fuels on a performance basis.

There are a few issues BP wishes to resolve with EPA. BP feels that EPA should accelerate the permitting process for the new process units that will be necessary to bring the new ultra low sulfur diesel on-line. BP also would like EPA to level the playing field by establishing a variance fee for non-compliant fuel so that companies that wish to make the investments early are not penalized.

Ms. Lev-On gave a brief overview of the segmentation of number two distillate production in the U.S. It is 67 percent highway diesel (the subject of the final rule), 15 percent heating oil, 11 percent non-road, 4 percent locomotive, and 3 percent marine. With the higher sulfur content in some of the non-road market, the potential for emissions from that fraction of the market could be much higher than the highway diesel, especially after the final rule is implemented. Segments such as the non-road (especially for agricultural emissions) and heating oil are very important on a regional and seasonal basis.

Ms. Lev-On next addressed the subject of natural gas. Currently, BP is the largest is the producer of oil and gas in the U.S. Ms. Lev-On briefly described today's gas market. Referring to graphs within her slide presentation, Ms. Lev-On asserted that demand for natural gas in the power generation sector has increased steeply in recent years. and BP expects that demand will continue to increase. Over 90 percent of the new generation projects in North America are gas-fired projects. Ms. Lev-On reminded the group that 30 percent of the gas-fired market is non-traditional utilities (e.g., independent power providers and various types of co-generation facilities). She stated that natural gas is the fuel of choice in power generation. Taking advantage of the new combined cycle gas turbine technology, natural gas has the lowest NO_X emissions from electric power generation by fuel on a tons per gigawatt hour basis. Comparing natural gas to oil, the NO_x emissions are essentially the same. However, oil exceeds natural gas in emissions due to the sulfur content and its contribution to SO_2 emissions.

Referring to a chart displaying U.S. production and number of active gas rigs in the U.S. over the past 11 years, Ms. Lev-On pointed out that production follows drilling. BP has confidence that with an increased level of drilling, production will follow, and the prices in the natural gas market will stabilize.

Ms. Lev-On summarized four beliefs held by BP. Liquid and gaseous fuels are essential to the economy and protecting the environment. Local and regional air quality improvements are strongly linked to availability of clean fuels. A flexible, performance-based regulatory framework provides market incentives. Finally, long term investments require certainty for large capital outlays. All of BP's investments are large capital investments that take many years to amortize, so BP supports having a regulatory framework that incentivizes early actions by companies and that prevents economic rewards for companies that are late in making changes or that show no action.

CURRENT ENERGY DEMAND AND SUPPLY ISSUES: Fuels and Air Quality - Margo Oge, OTAQ

Ms. Oge began by stating that she had two subjects to address having to do with the supply of fuels. The first is how EPA is dealing with the supply issue in terms of regulatory programs (the Tier 2 and low sulfur gasoline program and the diesel rule). The second subject is promising new programs EPA is creating to address vehicle miles traveled (VMT) issues and to promote clean air technologies.

Ms. Oge mentioned some statistics to show the significance of the transportation sector to the energy issue and environmental concerns. She stated that the transportation sector is responsible for over 67 percent of oil consumption, 33 percent of CO_2 emissions, 79 percent of CO emissions, 53 percent of NO_x emissions, and about 44 percent of VOC emissions.

Ms. Oge described the breakdown of petroleum use. She stated that 40 percent of all oil consumed is used for personal vehicles, 27 percent is used by other transportation (such as heavy duty diesel trucks, gasoline trucks, off-road equipment, and aircraft). Other sectors consume the remaining 33 percent of petroleum. The breakdown of types of fuel used is as follows: 79.8 percent gasoline, 17.9 percent diesel, 1.5 percent MTBE, 0.6 percent Ethanol, and 0.22 percent LPG and CNG.

Ms. Oge mentioned that in the past four years, EPA has undertaken historically significant emissions reduction initiatives. In the past, EPA looked at fuel and engines separately. However as emissions technologies became more sophisticated, EPA realized that sulfur in gasoline significantly impairs the ability of the catalyst to reduce emissions. Sulfur in diesel fuel has essentially the same effect as lead in gasoline. In order to move forward in reducing emissions, EPA is addressing fuel and engines as a system. In the Tier 2 and diesel standard, EPA regulates the vehicle and fuel as a system to optimize costs and environmental benefits.

In developing the Tier 2 and diesel standards, EPA considered the following factors: air quality need, technology feasibility, benefits and costs, economic impacts on the industry, impacts on fuel supply and availability, fuel distribution system impacts, and timing and overlap with other programs. She stressed that the public health benefits (such as deaths avoided and respiratory impacts) and environmental benefits (e.g. visibility and acid rain) of these programs would be significant. The Tier 2 program will help the U.S. avoid 4,000 premature deaths. The diesel program, when fully implemented, will help the nation avoid 8,000 premature deaths.

The costs to industry are significant but considerably lower than the benefits. For example, the Tier 2 program cost is $4 billion while the benefits are $23 billion. Ms. Oge assured Committee members that it should not be hard to find the technologies that remove the sulfur from fuel. New technologies are being developed constantly. EPA took a serious look at industry concerns regarding supply and, with the support of many companies within the oil industry, created a number of flexibility mechanisms.

Ms. Oge explained that the provisions allow refiners to spread their investments over eight years. Both programs have significant banking and trading programs to encourage earlier reductions. Currently, there are a number of gasoline companies making 30 ppm gasoline fuel available across the country. In return, these companies receive credits that they can use towards implementing the program within the timeframe. Many of these companies are considering early implementation of the 15 ppm diesel fuel standard as well.

Ms. Oge stated that both programs have phase-in options as well. In the Tier 2 sulfur gasoline program, companies have from 2004 to 2006 to implement the program. For the diesel fuel program, companies have from 2006 to 2009 to phase in the program. EPA is providing special relief for small refiners as well as western refiners (in the Rocky Mountain region). EPA has created a general hardship relief provision for any refiner. A refiner can explain their situation to EPA and may receive an extension. Ms. Oge stressed that EPA is not ignoring the supply issue when creating its regulations.

Next, Ms. Oge discussed the VMT strategies on which EPA is working currently. EPA and industry have been very successful in the past 30 years with using technology to reduce emissions from cars and trucks. Now, the real challenge is to reduce the growth of VMT. VMT growth is outpacing population growth. VMT itself has doubled in the past 30 years. By reducing VMT, fuel will be conserved and air pollution will be reduced.

Describing some of the key initiatives to reduce transportation energy demands, Ms. Oge explained that EPA has two industry partnerships the Commuter Choice Program and the Ground Freight Management Initiative. The Commuter Choice Program has had a strong start. EPA expects to have 300 partners this year. Ms. Oge explained that the Program builds on some recent federal tax code changes that provide financial incentives to provide green commuting options to their employees. She encouraged anyone interested in joining the Program to talk to her.

Regarding the Ground Freight Management Initiative, Ms. Oge mentioned that EPA currently is working with five ground freight companies. The idea is to identify and implement voluntary programs for these companies. EPA also is working on developing state and local partnerships to promote Smart Growth and the Clean Air Transportation Communities Initiative in an effort to reduce VMT and thus improve air quality. In addition, EPA released its land use guidance last year. EPA is working with five states to demonstrate this guidance. Finally, EPA also has proposed to identify communities to help EPA demonstrate good land use strategies including how advanced technologies can be used to reduce VMT.

CURRENT ENERGY DEMAND AND SUPPLY ISSUES: Fuels for Electric Power Generation - Paul Stolpman, OAP

Mr. Stolpman began his discussion of renewables by mentioning some statistics displayed in pie charts on his slides. He mentioned that the data comes from the Energy Information Agency s *Annual Energy Outlook for 2001*. EPA used this data to project total generation of electric power from 1999 to 2020. According to the projection, total generation will grow 44 percent over this period of time, which is a very large amount of growth in this sector. This analysis is built entirely on the economics of the various fuels and what fraction of the market these fuels will take. The renewable fraction, which is relatively small in 1999 at 10.4 percent, will shrink as a fraction of the total pie between now and 2020. Natural gas will win in the marketplace, liquid fuels will dominate the transportation sector to an even greater degree, and coal use will go down. Hydroelectric power is the dominant source of renewable energy today and will remain so in 2020 as well. Other growth will occur in the areas of wind, geothermal, and municipal waste combustors, which will grow as a fraction of the total renewables pie. Solar will see some growth and biomass will see the least growth out of these renewables. The overall picture will not change very much but total generation will increase from 385 billion kilowatt hours to 444 billion kilowatt hours. Mr. Stolpman contrasted this small growth to the larger increase in total generation, from 3,688 GWh to 5,298 GWh, stating that the growth in renewables is rather modest over that time period.

Mr. Stolpman next commented on the supply of renewables should the country, for environmental reasons, wish to continue using them. In the future, because of the economics of the situation, coal will remain dominant, natural gas will grow, and renewables will remain a small part of the overall electric power generation mix. Mr. Stolpman commented that policy and legislative decisions could accelerate the growth of renewables. The Clinton Administration proposed in an energy bill the idea of renewable portfolio standards, which is a regulatory program in which EPA would insist that a fraction of production come from renewables. That particular bill called for a growth in non-hydro renewables from less than 2 percent to up to 7.5 percent by 2010. Twenty-four states have committed to restructuring their electricity power generation mix. However, federal momentum toward electricity restructuring has stalled due to the current situation in California. Sixteen states have renewable energy funds of over $3.5 billion, with an aim of 8,400 megawatts of new renewables capacity by 2012. Legislators have started to introduce new bills, including one in which tax credits are given in the renewables area. Another possible way to grow the renewables sector would be to pass a multi-pollutant bill.

PRESENTATION AND DISCUSSION OF NSR AND PERMITTING ISSUES - Mike Scheible, California Air Resources Board and Bill Harnett, EPA-OAQPS

Mr. Scheible began by discussing some of the background to the current situation in California. He said that deregulation has led to an uncompetitive market where the power is held by the merchant plant owners, and the prices are set by them are not at all responsive to the cost of producing electricity. Electricity prices are five times higher in 2000 and 2001 than in 1999. Had the market in California been functioning, power prices most likely would have doubled or tripled because natural gas prices have increased greatly. Mr. Scheible also mentioned that prices in California are typically double those in other states because of the scarcity of capacity. It is unclear what prices are actually being paid by the power producers, as many of them have long-term contracts with their own pricing mechanisms.

Mr. Scheible explained the impacts of this situation. Power is chronically in short supply. This does not necessarily result in blackouts, but there commonly is uncertainty about where power will be supplied from up to three hours before it is needed. Ten to 25 percent of the power has to be bid in at the last minute, in which case the prices are even higher than they usually would be. Because there is no extra supply, if a large power plant goes offline suddenly, blackouts result. California often is very close to having blackouts, but they are not common occurrences.

The problems do not seem to correlate directly with the amount of power demanded, which leads many to believe that the problem is related to the market structure rather than the physical ability of the plants to produce the power.

The California utilities are on the brink of financial failure, which leads to a lower power supply because gas is not being supplied by those who are still owed money. The state currently is the major power purchaser within California. It spends $50 to $60 million a day buying electricity and has already spent about half of its $8 billion budget surplus.

There has been an increase in air pollution emissions from power generators. The fossil fuel plants frequently are operating along with dirtier plants intended for peaking periods that are available when other, cleaner plants are off-line. This increase has been balanced by reductions in other areas. Thus, overall, air quality is not worse, but emissions from power supply have increased.

Blackouts have occurred when demand is at 30,000 MW. The typical summer demand of 61,000 MW could be a problem. If the financial situation is resolved, most likely only the hottest days will be problematic.

California has 54,000 MW of capacity. It expects imports of 5,000 MW, 3,000 of which are through fairly firm contracts. The other 2,000 MW may be hard to obtain and would be expensive. California expects 3,000 MW of its in-state capacity to be out of service. So, at peak periods, California will have a shortfall of about 5,000 MW, which is equal to the additional peaking power required for just a few hours on a few days of the year. However, if the financial situation is not resolved, the shortfalls will occur most weekdays of the summer.

California hopes to fill the gap by maximizing conservation (e.g., through rate increases and calls to the public for conservation), funding energy-saving measures (e.g., energy-saving traffic lights), working to open new central power stations, and adding peaking capacity (e.g., installing new natural gas fired combustion turbines by the summer).

Since 1999, ten power plants consisting of 63,000 MW total have been fully approved in California. Six currently are under construction, and the rest are arranging their financing. Fourteen power plants are in the process of being approved and likely will be approved. The air permitting process is a barrier, but not an insurmountable one. Offsets in certain areas are a sizeable constraint and will continue to be as more plants are built because offsets become more expensive. Currently, offsets are between half of a percent and three percent of the price of a power plant. Price is not as much of an issue as whether these offsets actually can be obtained.

The governor of California has issued orders instructing the air resources board and the air pollution control districts to expedite the permitting process to keep existing units online without significantly compromising environmental regulations. The result is a system that modifies emission limits for existing facilities that formerly had permit limitations on the number of hours or annual emission levels such that if the facility reaches its limit, it may continue operating. However, the facility must pay a mitigation fee which is used to buy emission reductions in the area where the excess emissions occurred. This operation is limited under call on an as needed basis. California has streamlined the review process for new peaking plants and generally have reduced the time it takes to obtain a permit to operate. These plants are required to install best available control technology, but if a plant is able to become operational by this summer but cannot install its control technology in time, it is allowed up to a year to operate at a higher emission mode (up to 25 ppm). As an incentive for new plants with peaking units, the state has created a bank of offsets. The state has taken mobile source emission reductions as offsets so that these units can obtain three years of offsets from the state with a permit for three years of operation. The state charges a fee for this permit, but there is a 50 percent discount if the operator agrees to sell the power back to California. California also has accelerated plant construction. All of these special provisions expire on December 31, 2001 at which point California will reassess the situation and decide how to proceed.

Local agencies have been authorized to shorten the state environmental quality act (CEQA) review time. The Air Resources Board is tracking all of the different units, administering the state offset bank, working to bring individual units in, and working with the CEC to expedite the permitting process.

Mr. Harnett discussed some of the outcomes of the current situation in California. Presidential orders have been issued, and the EPA is working with California on issues such as permitting. EPA has developed a task force on energy issues across the ten regions. The task force is looking at Title 5 and NSR and trying to improve the situation in time for the summer. EPA is working to increase flexibility and expedite permitting. It also is attempting to move away from a system that reacts to problems and move towards an incentivized system. This new system will be one that produces cleaner energy such as combined heat and power and that fits within the current regulatory structure. EPA is considering approaches that create incentives by providing regulatory relief to operators who agree to emissions reductions. Mandating reductions is much less efficient.

Questions and Comments

Mr. Wyman stated that he has worked on several of these projects and that it has been an extraordinary exercise to see how quickly the Air Resources Board has reacted. He asserted that there is one item left to tackle the development of accounting protocols for mobile and area source credits. As generation increases, emissions will increase as well. EPA will need to find ways to offset these increased emissions. Mr. Wyman stated that mobile and area source credits are the only way to offset these emissions. The South Coast should be adopting these rules on May 11, and then the rules will go to the state and federal reviewing agencies. Mr. Wyman urged the state and federal agencies to act quickly to approve the rules. Mr. Brenner added that what has made the process work thus far is the commitment from all sides to ensure that environment is made whole. If offsetting reductions can be found in

California, it should be possible to find them in other areas of the country. Mr. Brenner stated that there may come a time when the requests for permits will not come with commitments to maintain environmental quality. At such a point, it will be more difficult to respond quickly. Mr. Wyman stressed that the reductions can be found and stated that the rules must be designed so that these reductions can be credited

Ursula Kramer, Pima County DEQ, mentioned that the Air Pollution Prevention Forum of the Western Regional Air Partnership is currently developing energy efficiency strategies. They have developed a short list of strategies that would work for residential as well as industrial sectors. They also are working on a contract to quantify potential benefits from these strategies. The Forum s goal is to make this information available shortly. Regarding EPA s task force on expediting the permitting process, Ms. Kramer asked how agencies facing these issues could deal with EPA effectively to expedite the permitting processes within the states. Mr. Harnett responded that working through EPA s regional offices currently is the most effective method. EPA hopes to deal with each issue only once and, thus, will work to convey information to all of the regions so that flexibility is given consistently. Meetings currently are held on a weekly basis to work through these issues. Ms. Kramer added that it is reassuring to look to California as an example because its air quality standards, for the most part, have been maintained.

A Committee member asked Mr. Harnett for a two-minute summary of issues regarding portable generators. Mr. Harnett responded that the issues currently being looked at are: (1) are the generators actually portable? (2) if they are temporary (i.e., for the summer) what kind of permitting do they need (for example, are they covered by NSR?). There are number of variations (for example, locomotives being hooked to the grid or non-road engines) that make it difficult to create a consistent approach. California is not the only area that feels the need to have more peaking power available. There are many special arrangements in different areas for the summer only. EPA is looking at the issue of these temporary sources.

Jeff Muffat, 3M, asked why natural gas prices are not spiking nationwide to the extent that they are in California. Mr. Scheible responded that in California, there is not enough capacity to meet the demand. So, California has to rely on other sources, and those controlling the product supply can command high prices. Mr. Muffat asked Mr. Scheible to expand his discussion of stand-by power. Mr. Scheible stated that California is not allowing use of backup generators as basic power sources. Use of these generators is permitted only during blackouts. California is putting its efforts into cleaner technologies, which are a bit more expensive but better for the environment. Mr. Muffat asked whether it is feasible for a high user of electricity to install a peaking plant. Mr. Scheible responded that if a facility can meet its own demand, it would be fine for that facility to add a gas turbine with acceptable controls. The facility would be free to sell to the grid. However, hooking up with a utility would be an issue for the facility, and it would take longer to obtain an air permit.

Mr. Bryant asked how one explains to an environmental justice organization that the market will take care of problems, given what has happened in California. Mr. Brenner responded that in California when there are energy shortages, any emissions increases must be accompanied by paying into a fund. These funds will be used for clean up such as diesel retrofits. Typically, during emergency situations, sources are given waivers, and there is no marketing system for

getting the offsets. Mr. Brenner stated that EPA needs to continue to find ways to make these programs work better.

Mr. Auberle asked whether the problem is a one- or two-year anomaly in the system or a chronic issue. Arizona has 9000 MW of new capacity coming online in the next 12 to 18 months, and Mr. Auberle stated that it would be helpful to know if there are potential complications (transmission distribution limitations) of which EPA could make Arizona aware. Mr. Kenny responded that a physical fix to the system is fairly simple. Within two or three years, provided that government and industry can agree upon and create a system that does not have flaws like the current system, the solution is to build more capacity. Transmission lines and local problems could be more of an issue in the next couple of years. Mr. Hamett added that the potential for supply problems exist in areas of the country other than California. There is very little excess capacity. Thus, if a plant needs to come offline at a peak time, it could create a shortage. Recently, there has been a big push to invest in new facilities and sources, but there still is a sizeable backlog in supply. Demand is growing faster than anticipated and is doing so in certain areas rather than throughout the country.

Mr. Johnson, in response to Ms. Lev-On s presentation, stated that it is important to address the issue of energy diversification and to create a system to avoid these crises. Given that BP expects a large growth in demand for gasoline and given that refineries are operating at 95 percent capacity, he asked Ms. Lev-On for her thoughts on whether more refining capacity will be needed. She replied that the country will need incremental refining capacity. The size of the increment will depend on how much balance can be achieved through conservation measures, increased fuel efficiency, and VMT reductions. In the last decade, the number of refineries in the U.S. decreased from approximately 194 to 155 refineries. The slack has been taken up by refineries streamlining their operations and increasing capacity. Capacity, however, has decreased while demand has been increasing.

Mr. Johnson asked whether, in terms of California s situation and generating capacity for electricity, there will be another shortage and crisis period during which capacity is quickly increased and rules are ignored. Ms. Lev-On responded that this was an important point but that rules do not need to be ignored during these crisis periods. She stated that building a new refinery is a big undertaking and that companies need to be convinced that it is a sound investment. In response to Mr. Kenny s earlier comment, Ms. Lev-On stated that industry has invested tremendously in co-generation units and that the state has helped sustain distributed generation and co-generation as independent power producers in lieu of building new power generating plants. However, the financial situation in California is such that many co-generation units have not been paid for their power for six or so months, causing qualified facilities to stop providing power to the grid. Ms. Oge added that assuming that the VMT rate continues to grow at the same rate or at a lower rate than it is growing now and no effort is made to improve fuel economy (i.e., the efficiency of vehicle engines remains at 15 percent, wasting 85 percent of the energy), by 2030, the country will need twice today s capacity at a minimum. The U.S. must find ways to conserve energy by reducing VMT.

Mr. Johnson agreed with Ms. Oge s assessment and commented that the number of gasoline companies has gone down. He asked whether, with this limited number of players, the U.S. will find itself critically short. He asked whoever is watching this issue to raise a red flag five years before another crisis happens rather than the summer after it happens. Mr. Brenner

commented that these roles most likely will be defined as part of the energy supply task force report under development within the administration. The report likely will be completed this spring.

Mr. Johnson commented that Ms. Lev-On s definition of biomass is an important factor because the emissions profile depends upon the type of biomass. He stated that diversification of energy supply and fuels is an important part of any strategy to avoid crises. EPA usually talks about emissions in terms of NO_x, SO_x, PM, CO, and mercury. Mr. Johnson stated that it is important to add other pollutants such as dioxins to the list to better equalize all resulting emissions. Regarding co-generation, Mr. Johnson said his region is working hard to promote combined heat and power to meet future demands and identify additional sources.

Ms. Greene responded to Mr. Johnson s comments. Regarding the comment that electrical demand is growing faster than anticipated and in pockets, Ms. Greene stated that the pockets of high tech and e-commerce should be looked at. She stated that distributed generation may be able to meet these pockets of demand where a dependence on grid-based solutions cannot. She stated that they may give fuel flexibility as well. Regarding refinery capacity concerns, the refining industry has been raising red flags for a while. Crises have been avoided in the past because companies have tried to work smarter to make facilities more productive. Ms. Greene asserted that part of the problem is that the policy side of EPA and the enforcement side are not working very well together, and companies are getting caught in the mix. For example, with the NSR/PSD regulations, in the area of actual to potential emissions calculations, even if a company states that a certain change will decrease its emissions, it still is difficult to make the change. When companies work more efficiently, it is considered an increase in capacity, so these companies are subject to fines and penalties. Government must decide what industry is expected to provided (for example, increased capacity or reduced emissions). If EPA allows industry to make operational tradeoffs and reduce emissions, industry probably will be able to do so provided that it is given flexibility.

Ms. Bankoff commented that she finds it interesting that the Committee has not focused on nuclear energy as a possible partial answer. It is not even considered a renewable in some ways. She asked Mr. Stolpman whether, when EIA looks at the various sectors, they look at them in terms of life cycle and overall environmental costs of renewables or only in terms of the energy generated. She asked Mr. Stolpman why renewables would be a desirable policy objective if they are uneconomical and if greater environmental benefits are obtained from gas and other clean fuels. Mr. Stolpman responded that renewables may be uneconomic because EPA is not requiring full cost accounting. It is essentially not requiring all of the emissions reductions that might be appropriate for all types of fuels. If government is satisfied with the emissions limits in place now, it should let them be uneconomic. However, if government wants to encourage fuel diversity as a public policy, it is moving in the wrong direction. If government believes that we do not have a full set of necessary emissions limits on all of the pollutants from sources, it either must simulate full cost accounting with some form of incentive or must impose the regulations to change the economics of the situation. Regarding nuclear energy in the EIA report, most of the reduction in capacity is a result of plants electing not to renew licenses when the facilities are not profitable. Ms. Bankoff asked if their lack of profitability was mostly due to issues of handling waste. Mr. Stolpman responded that he is not sure the cause of the marginal profitability of some units.

Ms. Bankoff asked Mr. Harnett and Mr. Brenner how much flexibility is possible regarding NSR suggestions to the energy task force or within the rulemaking. The general wisdom is that people are excluded from NSR review if there is a growth in demand. She said that the State of Georgia is working with process called wet compression that makes dry low NO_x and a gas turbine more efficient so that greater NO_x reductions and greater efficiency are achieved. However, this process may be treated as a modification. This treatment would be a disincentive at a time when the government should be trying to get more efficient systems online immediately. Mr. Harnett responded that EPA is working to push efficiency forward on any front, especially when it means producing more of a product while generating fewer emissions. However, if increasing efficiency means increasing the potential for the plant to both run more and emit more, then efficiency may be an issue. To the degree that a source is willing to commit to holding down emissions, it can avoid NSR, make the efficiency improvements, and move forward. When a source will not commit to emissions limitations, EPA must test all of the emissions. Mr. Harnett stated that although these entities claim they will emit less, often they do not want to guarantee it.

Stacey Davis, Center for Clean Air Policy, commented that EPA is thinking about a few other kinds of incentive programs for energy efficiency and renewables. Under an auction allocation, funds for energy efficiency and renewables would be created through a reverse auction program. EPA also is looking into an escape-hatch program in which a company would be allowed to exceed a cap by spending a limited amount of money on energy efficiency and renewables. Ms. Davis asked Ms. Lev-On whether, when she commented that natural gas prices are expected to stabilize, that is based on an assumption of a four-pollutant bill. Ms. Lev-On responded that new gas rigs are being installed across the U.S. To bring this gas to the market, the U.S. needs the infrastructure. There also have been attempts to reactivate some liquid natural gas terminals that have been dormant for years, but there needs to be a discussion of how to reactivate and re-permit these terminals.

Mr. Rosenberg commented that the South Coast Board just authorized the executive officer to invest several million dollars in retrofitting tugboats in the region to balance out the greater activity in the power sector. He stressed how important it is for EPA to approve the changes needed to the RECLAIM program as soon as possible such that part of the rule requires sources to install SCR. This will help end the need for the special exemption. He also urged EPA to quickly approve the protocols that Mr. Wyman mentioned, stating that the sooner they are approved, the less the environment will be damaged.

The meeting was adjourned at 4:06 pm.

Clean Air Act Advisory Committee Meeting
March 28, 2001
Attendee List

NAME:	ORGANIZATION:
Auberle, William	Northern Arizona University
Ayres, Richard	Ayres Law Group
Bankoff, Barbara	Eli Lilly and Company
Becker, William	STAPA/ALAPCO
Bradley, Michael	M.J. Bradley Associates
Brenner, Rob	EPA-OAR
Brownstein, Mark	PSEG
Bryant, Bunyan	University of Michigan
Clay, Don	Koch Industries, Inc.
Cochran, Steve	Environmental Defense Fund
Collett, Chuck	NAHB
Cooper, Ben	Printing Industries of America
Cooper, Josephine	Alliance of Automobile Manufacturers
Craig, Beth	EPA
Crouch, John	Hearth Products Association
Delgado, Jane	National Alliance for Hispanic Health
DeLucia, Anthony	American Lung Association
Earl, Tony	Quarles and Brady LLP
Ellis, Kathy	U.S. Navy
Gade, Mary	Sonnenschein, Nath & Rosenthal
Gerritson, Steve	Pacific Rim Enterprise Center
Giblin, Pam	Baker & Botts LLP
Goldsmith, Wiliam	Cornell University
Green, Carolyn	Sunoco
Greenbaum, Daniel	Health Effects Institute
Grumet, Jason	NESCAUM
Harnett, Bill	EPA-OAQPS
Harry, Ray	Southern Company Generation
Hawkins, David	Natural Resources Defense Council
Henneke, Ben	Clean Air Action Corporation
Hunt, Tim	American Forest and Paper Association
Johnson, Alex	Delta Institute
Johnson, Timothy	Corning Incorporated
Keeler, Jeff	Enron Corporation
Kramer, Ursula	Pima County DEQ
Lewis, William	Morgan, Lewis & Bockius LLP
Lev-On, Miriam	ARCO
Locke, Paul	Trust for America s Health

Clean Air Act Advisory Committee Meeting
March 28, 2001
Attendee List (continued)

NAME:	ORGANIZATION:
Marquez, Ralph	TNRCC
McWilliams, Al	Engelhard Corporation
Mohin, Tim	INTEL
Muffat, Jeff	3M
Nishida, Jane	Maryland Department of Environment
Oge, Margo	EPA-OTAQ
Page, Steve	EPA-ORIA
Paul, John	RAPCA
Perciasepe, Robert	The IT Group, Inc.
Quanstrom, Walter	BP Amoco
Raher, Patrick	Hogan & Hartson LLP
Rasmussen, Paul	EPA-OAR
Rosenberg, William	E3 Ventures
Scheible, Mike	California Air Resources Board
Seitz, John	EPA-OAQPS
Shapiro, William	Volvo Cars of North America
Stolpman, Paul	EPA-OAP
Sugar, William	Anheuser-Busch Companies
Whitman, Christine Todd	EPA
Williams, Robert	Princeton
Wilson, Richard	National Environmental Strategies
Wright, Michael	United Steelworkers of America
Wyman, Robert	Latham and Watkins
Zaw-Mon, Merrylin	EPA